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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/828,635	04/05/2001	Kyusik Sin	K35R1681/3480p	5517
35219	7590	03/30/2007	EXAMINER	
WESTERN DIGITAL TECHNOLOGIES, INC. ATTN: SANDRA GENUA 20511 LAKE FOREST DR. E-118G LAKE FOREST, CA 92630			BERNATZ, KEVIN M	
		ART UNIT	PAPER NUMBER	
				1773
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	03/30/2007	PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/828,635	SIN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kevin M. Bernatz	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on \_\_\_\_.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-3,6,8-11 and 14-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 11 and 14-19 is/are allowed.
- 6) Claim(s) 1,3,6 and 8-10 is/are rejected.
- 7) Claim(s) 2 is/are objected to.
- 8) Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. ____ .                                     |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/13/05</u> | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: ____ .                         |

**DETAILED ACTION**

***Response to Amendment***

1. Amendments to claims 1, 11 and 17 and cancellation of claims 7 and 20, filed on December 27, 2006, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

***Claim Objections***

3. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Claim Rejections - 35 USC § 103***

4. Claims 1, 3, 6 and 8 – 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mack et al. (U.S. Patent No. 6,462,919 B1) in view of Baumgart et al. (U.S. Patent No. 5,287,238) as evidenced by Schwarzl (DE 19836567 A1) for the reasons of record as set forth in Paragraph No. 6 of the Office Action mailed on September 26, 2006. See U.S. Patent App. No. 2001/0050859 A1, which is the English language equivalent of DE '567 A1.

Regarding the amended language for claim 1 that the second antiferromagnetic (AFM) layer has a lower blocking temperature and said first AFM layer has a high

blocking temperature, as well as dependent claims 3, 6, 8 and 10, the Examiner notes that this limitation is met by considering the first AFM layer as element 22B in Figure 6B, said first ferromagnetic (FM) layer as element 224B, said third nonferromagnetic (NFM) layer as 226B, said fourth FM layer as element 228B, said first NFM layer as element 230B, said second FM layer as element 232, said second NFM layer as element 234, said third FM layer as element 236 and said second AFM layer as element 238.

Regarding claim 9, the limitations are met by considering first AFM layer as element 22B in Figure 6B, said first ferromagnetic (FM) layer as element 228B, said first NFM layer as element 230B, said second FM layer as element 232, said second NFM layer as element 234, said third FM layer as element 236, said second AFM layer as element 238, and said fourth FM layer as element 228A. Applicants are reminded that the term “adjoining” allows for additional layers therebetween (i.e. the fourth FM layer is deemed to be “adjoining” the second NFM layer, despite elements 232 and 230A being located therebetween).

The Examiner notes that Mack et al. explicitly teach that the bias structures (i.e. AFM elements 222A and 222B) have a high blocking temperature. As such, given that Baumgart et al. provides the motivation to use different blocking temperatures, the Examiner deems that the claimed invention is obvious in view of the combined prior art teachings. Namely, it would have been obvious to one of ordinary skill in the art to form the second AFM layer (element 238) to have a lower  $T_b$  than the first AFM layer (element 222B) since Baumgart et al. teach that this facilitates pinning the individual layers separately and Mack et al. teach that the bias structure should have a high  $T_b$ .

***Allowable Subject Matter***

5. The following is a statement of reasons for the indication of allowable subject matter: claims 11 and 14 – 19 are deemed allowable over the prior art of record, since Mack et al. explicitly teach away from using a low  $T_b$  material as part of the bias structure for stabilizing the magnetic domains of said free layer.

***Response to Arguments***

6. **The rejection of claims 1, 3, 6 and 8 - 10 under 35 U.S.C § 103(a) – Mack et al. in view of various references**

Applicant(s) arguments have been considered but are moot in view of the new ground(s) of rejection. In so far as they apply to the present rejection of record, Applicant(s) argue that “Applicant can find no mention in Baumgart that the blocking temperature of the biasing antiferromagnetic layer can or should be less than the blocking temperature of the pinning antiferromagnetic layer” (*page 9 of response*). The Examiner respectfully disagrees with Applicants’ argument given that claim 1 does not recite a biasing structure, but simply refers to the layers in terms of whether they have free or fixed magnetic moments. The Examiner notes that both pinning and biasing ferromagnetic layers possess fixed magnetic moments.

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**7. The rejection of claims 1 – 3, 6, 8 – 11 and 14 - 19 under 35 U.S.C § 103(a) – Noma et al., in view of various references**

The above noted rejection has been withdrawn because Applicant(s) have antedated the effective filing date of the various Noma et al. references (US and WO).

***Conclusion***

**8. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

**9.** Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Kevin M. Bernatz whose telephone number is (571) 272-1505. The Examiner can normally be reached on M-F, 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the Examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KMB  
March 27, 2007



Kevin M. Bernatz, PhD  
Primary Examiner